DOCUMENT MODIFICATION REQUEST (DMR)

Refer to 1-A01-PPG-001 for Processing Instructions
***Print* or *Type* All Information (Except Signatures)**

1 Date	25
11/8/94	DMR No 94-DMR-002107

2 Existing Document Number/Revision	3 New Document Number or Document Number if it is to be changed with this Revision
5-21000-OPS-GT 6, Rev 2	N/A
4 Originator's Name/Phone/Pager/Location	**5 Document Title**
Laurie Peterson-Wright/8553/7444/080,285	Monitoring Well and Piezometer Installation

6 Document Type: ☒ Procedure ☐ Other _____

7 Document Modification Type (Check only one): ☐ New ☐ Revision ☐ Intent Change ☒ Nonintent Change ☐ Editorial Correction ☐ Cancellation

8 Item	9 Page	10 Step	11 Proposed Modifications
1	8	6 3 1 2	1st sentence Change to "Well screens for wells in IHSS 110 will consist of new threaded stainless steel or PVC with 0 020 inch or larger factory-machined slots "
2	8	6 3 1 2	4th sentence Change to "A 6-inch sediment sump will be used beneath the screen "
3	8	6 3 1 3	Insert at end of paragraph "No filter pack material will be used in wells in IHSS 110 "
4	9	6 3 1 4	Insert at end of paragraph "No bentonite seals will be installed in wells in IHSS 110 "
5	9	6 3 1 5	1st sentence Change to "The annular space between the well casing and the borehole will be grouted from the grout baskets at a depth of approximately 3 feet below ground surface to 1 foot below ground surface Dry bentonite chips or pellets will be used at the bottom to seal off the open hole Wet bentonite grout will be used above it "

12 Justification (Reason for Modification EJO # TP # etc.)

1-5 In order to extract dense non aqueous phase liquids (DNAPLs), 4-inch diameter wells installed at IHSS 110 will have screens with a larger slot size and shorter sump No filter pack material will be used because of the presence of large voids Dry bentonite chips or pellets will be used to seal the borehole Because the screen depth is less than 5 feet below ground surface, the thickness of bentonite grout above the seal will be approximately 2 feet "

The scope of this modification is for applicable work to be performed at Operable Unit 2 only and will be documented in 21000-WP-OU02 07 "Pilot Test Plan Soil Vapor Extraction Technology Subsurface IM/IRA "

This is temporary, limited scope Expires Dec. 23, 1994

If modification is for a new procedure or a revision, list concurring disciplines in Block 13 and enter N/A in Blocks 14 and 15 If modification is for any type of change or a cancellation organizations are listed in Block 13 then Concurror prints and signs in Block 14 and dates in Block 15

13 Organization	14 Print, Sign (if applicable)	15 Date (if applicable)
QS	R S Luker	11 8 94
SME	R G Smith	11/8/94
OU 2 PM	P J Laurin	11/8/94

16 Originator's Supervisor (print sign date): Ed Mast 11/8/94

17 Assigned SME/Phone/Pager/Location	18 Cost Center	19 Charge Number	20 Requested Completion Date	21 Effective Date
R G Smith/8705/5135/080	3112	989516-00		11/9/94

22 Accelerated Review? Yes ☒ No ☐

23 ORC Review

24 Responsible Manager (print sign date): Wanda S Busby

RF-47940 (5/93)

ADMIN RECORD

REVIEWED FOR CLASSIFICATION / UCNI

BY _____

DATE _____

DMR (continuation sheet)

10/9/94

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25 DMR No. 94-DMR-002107

2 or 3 Document Number/Revision	5 Document Title
5-21000-OPS-GT 6, Rev 2	Monitoring Well and Piezometer Installation

8 Item	9 Page	10 Step	11 Proposed Modifications
6	13	6 3 2 1	Add new paragraph at end of section "In trenches in IHSS 110, dry bentonite chips or pellets will be placed above the grout baskets instead of filter pack Bentonite grout will be placed above the dry bentonite to 1 foot below ground surface Cement grout will be placed from 1 foot below ground surface to the surface "

12 Justification (Reason for Modification)

6 No filter pack material will be used because of the presence of large voids Dry bentonite chips or pellets will be used to seal the borehole Because the screen depth is less than 5 feet below ground surface, the thickness of bentonite grout above the seal will be approximately 2 feet "

the joint threads to improve the seal All well casings will be free of foreign material and will be steam cleaned with approved water before use Steam-cleaned casings will be stored in plastic sleeves prior to use Casing with stamped or stenciled nomenclature will not be used

6 3.1 2 Well Screens

Well screens for wells in IHSS 110 will consist of new threaded stainless steel or PVC with 0 020-inch or larger factory-machined slots All well screens will have an I D equal to or greater than that of the well casing The wall thickness of PVC screen will be the same as that of the well casing A 6-inch sediment sump will be used beneath the screen A threaded cap or a slip-on cap secured with stainless steel screws will be provided at the bottom of the sump Well screen with stamped or stenciled nomenclature will not be used

6 3 1 3 Filter Pack

The filter pack material will be chemically inert, rounded, silica sand of appropriate size for the well screen and host environment Grain size analyses of the unconsolidated formations underlying the site have indicated a 16-40 gradation is appropriate, and it will be used on the site unless the FSP or project-specific work plan indicates otherwise The filter pack will extend approximately 2 feet above the top of the screen unless otherwise specified Where the thickness of the alluvium is insufficient, the top of the filter pack may extend 6 inches above the top of the screen The final depth to the top of the filter pack will be measured directly by using a weighted tape measure and not by using volumetric calculation methods The volume placed will be recorded No filter pack material will be used in wells in IHSS 110

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6 3 1.4 **Bentonite Seal**

A bentonite seal will be installed above the filter pack The seal will consist of a layer of commercially available bentonite pellets that is at least 3 feet thick when measured immediately after placement, without allowance for swelling No bentonite seals will be installed in wells in IHSS 110

6.3.1.5 **Bentonite Grout**

The annular space between the well casing and the borehole will be grouted from the grout baskets at a depth of approximately 3 feet below ground surface to 1 foot below ground surface Dry bentonite chips or pellets will be used at the bottom to seal off the open hole Wet bentonite grout will be used above it The grout will consist of high-solids reduced pH bentonite grout (American Colloid Pure Gold or approved equivalent) mixed in a powered mechanical grout mixer according to the grout manufacturer's recommendations The grout may be mixed by hand for intervals less than 5 feet thick The grout will contain at least 30 percent solids by weight and have a minimum density of 9 9 pounds per gallon after mixing The density will be checked with a mud balance

Grout will be placed outside of the monitoring well casing using a side-discharge tremie pipe located just above the top of the bentonite seal The grout will be pumped through the pipe until undiluted grout flows from the annular space at the ground surface The tremie pipe will then be removed and more grout added to compensate for settling After 24 hours, the site will be checked for grout settlement and more grout added to fill any depressions The total volume placed will be recorded

When excessive grout loss into landfilled materials occurs, grouting will be stopped and bentonite chips or pellets will be added to the annular space to seal off the area losing grout A minimum of two feet of pellets or chips will be added, then grouting will resume as above If grout loss continues or if grout is again lost further uphole, grouting will again be stopped and additional bentonite pellets or chips will be added until grout loss is stopped

In trenches in IHSS 110, dry bentonite chips or pellets will be placed above the grout baskets instead of filter pack Bentonite grout will be placed above the dry bentonite to 1 foot below ground surface Cement grout will be placed from 1 foot below ground surface to the surface

6 3 2.2 Bedrock Piezometer and Monitoring Well Installation

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Figure GT 6-2 shows a schematic diagram of the lower portion of a bedrock well completion Bedrock piezometers and monitoring well installations will be similar to the alluvial well installation procedures except that a surface casing may be provided through the alluvium to guard against potential cross-contamination of bedrock aquifers by contaminated alluvial groundwater If required, the surface casing will extend from the ground surface to at least 3 feet below the alluvial/bedrock contact This casing will be installed according to SOP GT 3, Isolating Bedrock from the Alluvium with Grouted Surface Casing

If rotary drilling methods (see SOP GT 4, Rotary Drilling and Rock Coring) are required, the installation procedures will be similar except that the well may be completed in an open hole instead of inside of hollow-stem augers The well string will be suspended approximately 2 inches above the bottom of the borehole prior to installing the filter pack This will reduce bending of the well assembly and minimize the potential for collapse of the casing due to the weight of fluid in the annulus Stainless steel centralizers will be placed at 20-foot-maximum spacing for wells completed in open holes

Where wells cannot be completed in an open hole because of stability or other problems and/or the well cannot be completed within augers, the well may be installed through casing This casing will be a diameter sufficient to provide a 2" annulus around the well casing and will consist of PVC or stainless steel The casing will be advanced to the selected depth either using no additional fluids